40-615
Very High Density Multiplexer Module

- Very High Density Multi-Banked Multiplexer
- Choice of 20, 10, 5, 4, 2 or 1 Multiplexers Per Module
- Up to 168 Switch Points Available with 1 or 2-Pole Switching Formats
- Screened Option For Improved Noise Performance
- All Versions Use High Reliability Pickering Reed Relays
- Fast Operating Speed <500µs
- Switch up to 150VDC/100VAC, 1.0A with 20W Max Power
- Versions Available With Automatic Isolation Switches To Reduce Capacitive Loading in Large Systems
- Factory or User Reconfigurable To Different Configurations As Needs Change
- VISA, IVI & Kernel Drivers Supplied for Windows XP/Vista/7/8
- Supported by PXI or LXI Chassis
- 3 Year Warranty

The 40-615 series of high density multiplexer modules feature a wide range of switching configurations, especially useful where a large number of small multiplexers are required. Typical applications include signal routing in ATE and data acquisition systems.

Each module is factory configured into one of the configuration modes (refer to schematics overleaf). Connections are made via a front panel 200-pin connector.

Available multiplexer formats are:-
20 Banks, 8 Channels, 1-Pole 20 Banks, 4 Channels, 2-Pole
10 Banks, 16 Channels, 1-Pole 10 Banks, 8 Channels, 2-Pole
5 Banks, 32 Channels, 1-Pole 5 Banks, 16 Channels, 2-Pole
4 Banks, 40 Channels, 1-Pole 4 Banks, 20 Channels, 2-Pole
2 Banks, 80 Channels, 1-Pole 2 Banks, 40 Channels, 2-Pole
1 Bank, 160 Channels, 1-Pole 1 Bank, 80 Channels, 2-Pole
6 Lower Density Versions 6 Screened Lower Density Versions Custom Sizes (100s of combinations)

The 40-615 multiplexer may be operated as a conventional multiplexer with break-before-make action when a new channel is selected. In addition multiple channels may be simultaneously selected (not available for 40-615-022 single pole high density mode).

The 40-615-022 single pole high density versions and 40-615-021-S screened low density versions have built in Automatic Isolation Switching. This connects only the currently active multiplexer bank to the analogue common, thereby keeping capacitive loading and leakage currents in large multiplexer systems to a minimum. Larger multiplexers may be constructed by Daisy Chaining the common signals from multiple PXI modules.

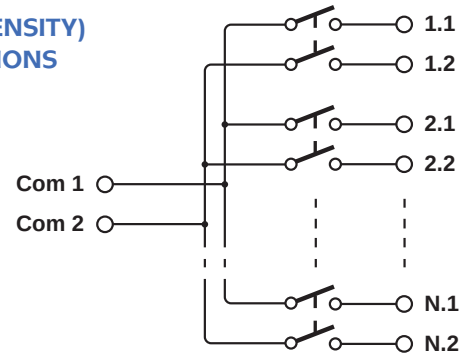
The screened version (40-615-021-S) is suitable where improved noise performance is required.

The 40-615 is part of a family of high density PXI Multiplexer modules all sharing similar architecture and the same 200 way connector, other members include the 40-610 and 40-670A High Density Multiplexer series.

ISSUE 8.0 MAY 2013

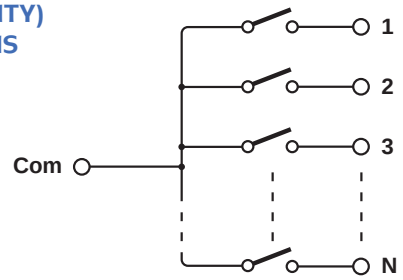
2-POLE MUX MODE (HIGH DENSITY) – AVAILABLE CONFIGURATIONS

- 20 Banks of 4 Channels
- 10 Banks of 8 Channels
- 5 Banks of 16 Channels
- 4 Bank of 20 Channels
- 2 Banks of 40 Channels
- 1 Bank of 80 Channels
- Custom Configurations



1-POLE MUX MODE (LOW DENSITY) – AVAILABLE CONFIGURATIONS

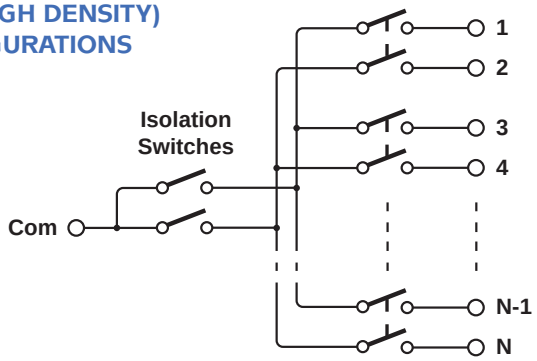
- 20 Banks of 4 Channels
- 10 Banks of 8 Channels
- 5 Banks of 16 Channels
- 4 Banks of 20 Channels
- 2 Banks of 40 Channels
- 1 Bank of 80 Channels
- Custom Configurations



1-POLE MUX MODE (HIGH DENSITY) – AVAILABLE CONFIGURATIONS

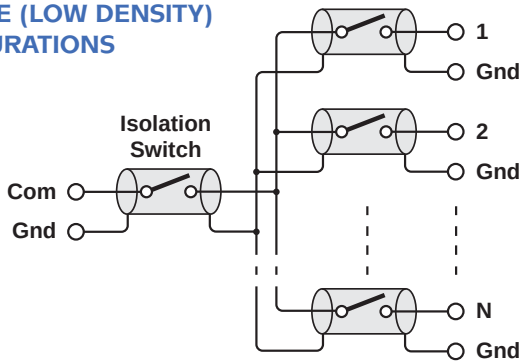
- 20 Banks of 8 Channels
- 10 Banks of 16 Channels
- 5 Banks of 32 Channels
- 4 Banks of 40 Channels
- 2 Banks of 80 Channels
- 1 Bank of 160 Channels
- Custom Configurations

Note: Multi-channel selection not available in this mode



1-POLE SCREENED MUX MODE (LOW DENSITY) – AVAILABLE CONFIGURATIONS

- 20 Banks of 4 Channels
- 10 Banks of 8 Channels
- 5 Banks of 16 Channels
- 4 Banks of 20 Channels
- 2 Banks of 40 Channels
- 1 Bank of 80 Channels
- Custom Configurations



40-961A-200
200-Way Mating
Connector

40-971A-200 200 Way
to 4x50-Way Cable
Assembly

Pickering have a wide range of connector and cabling options please consult PXI connector & cabling datasheets or visit our web site

pickering

pickeringtest.com

Switching Specification

Switch Type:	Ruthenium Reed
Max Switch Voltage:	150VDC/100VAC
Max Power: Max Switch Current: Max Carry Current:	20W 1.0A 1.2A
Initial Path Resistance On (Single Module): Off (Single Module): Thermal Offset:	 <1Ω $>10^9$Ω <10µV
Bandwidth (3dB, 1 module)	>5MHz †
Operate Time: Release Time:	<0.5ms <0.5ms
Expected Life Low power load: Full power load:	 $1x10^9$ operations $>1x10^6$ operations

† Bandwidth is configuration dependent (please consult sales office for further information).

Relay Type

The 40-615 is fitted with Reed Relays (Ruthenium sputtered type), these offer very long life with good low level switching performance and excellent contact resistance stability.

Spare Reed Relays are built onto the circuit board to facilitate easy maintenance with minimum downtime.

All reed relays are manufactured by our sister company Pickering Electronics, www.pickeringrelay.com.

Power Requirements

+3.3V	+5V	+12V	-12V
0	1350mA (typ 280mA)	0	0

Mechanical Characteristics

Single slot 3U PXI (CompactPCI card).
Module weight: 240g (40-615-022)
3D models for all versions in a variety of popular file formats are available on request.

Support Products

Self-Test Diagnostic Tool (PI-MXT)

Some of these module configurations are compatible with Pickering's 90-100 PI-MXT test tool. This enables all switch paths to be automatically tested so that faulty relays can be easily identified. The tool consists of a Windows executable program and an adapter for the specific module, a user supplied multimeter capable of 4-wire resistance measurement is also required.

The PI-MXT test adapters required for the 40-615 series are as follows:

90-100-227 supports 40-615-022/10/8/2
90-100-228 supports 40-615-022/20/4/2

For further details on the PI-MXT tool, please refer to the 90-100 data sheet and user manual available from the Pickering website.

Spare Relay Kits

Kits of replacement relays are available for the majority of Pickering's PXI switching modules, simplifying servicing and reducing down-time.

The relay kits for the 40-615 range are as follows:

91-100-008 & 91-100-015 kits for 40-615-022
91-100-003 & 91-100-015 kits for 40-615-021
91-100-011 & 91-100-15 kits for 40-615-021-S

For further assistance, please contact your local Pickering sales office.

Connectors

PXI bus via 32-bit P1/J1 backplane connector.
Signals via a front panel 200-way female LFH connector.

Product Order Codes

High Density Configurations:

20 Bank, 8 Channel, 1-Pole MUX	**40-615-022-20/8/1**
20 Bank, 4 Channel, 2-Pole MUX	**40-615-022-20/4/2**
10 Bank, 16 Channel, 1-Pole MUX	**40-615-022-10/16/1**
10 Bank, 8 Channel, 2-Pole MUX	**40-615-022-10/8/2**
5 Bank, 32 Channel, 1-Pole MUX	**40-615-022-5/32/1**
5 Bank, 16 Channel, 2-Pole MUX	**40-615-022-5/16/2**
4 Bank, 40 Channel, 1-Pole MUX	**40-615-022-4/40/1**
4 Bank, 20 Channel, 2-Pole MUX	**40-615-022-4/20/2**
2 Bank, 80 Channel, 1-Pole MUX	**40-615-022-2/80/1**
2 Bank, 40 Channel, 2-Pole MUX	**40-615-022-2/40/2**
1 Bank, 160 Channel, 1-Pole MUX	**40-615-022-1/160/1**
1 Bank, 80 Channel, 2-Pole MUX	**40-615-022-1/80/2**

40-615-022 modules can be factory reconfigured into any of the above configurations.
1-Pole configuration does not allow multi-channel selections (refer to manual for details). Only applies to 40-615-022.

Low Density Configurations:

20 Bank, 4 Channel, 1-Pole MUX	**40-615-021-20/4/1**
10 Bank, 8 Channel, 1-Pole MUX	**40-615-021-10/8/1**
5 Bank, 16 Channel, 1-Pole MUX	**40-615-021-5/16/1**
4 Bank, 20 Channel, 1-Pole MUX	**40-615-021-4/20/1**
2 Bank, 40 Channel, 1-Pole MUX	**40-615-021-2/40/1**
1 Bank, 80 Channel, 1-Pole MUX	**40-615-021-1/80/1**

40-615-021 modules can be reconfigured into any of the above configurations.

Screened Low Density Configurations:

20 Bank, 4 Chan Screened 1-Pole MUX	**40-615-021-S-20/4/1**
10 Bank, 8 Chan Screened 1-Pole MUX	**40-615-021-S-10/8/1**
5 Bank, 16 Chan Screened 1-Pole MUX	**40-615-021-S-5/16/1**
4 Bank, 20 Chan Screened 1-Pole MUX	**40-615-021-S-4/20/1**
2 Bank, 40 Chan Screened 1-Pole MUX	**40-615-021-S-2/40/1**
1 Bank, 80 Chan Screened 1-Pole MUX	**40-615-021-S-1/80/1**

40-615-021-S modules can be reconfigured into any of the above configurations.

Mating Connectors & Cabling

For connection accessories for the 40-615 series please refer to the **90-002D** 200-way LFH Connector Accessories data sheet where a complete list and documentation can be found for accessories, or refer to the Connection Solutions catalog.

PCB Layout for the 40-615 Very High Density Multiplexer Module

pickering

pickeringtest.com

Programming

Pickering provide kernel, IVI and VISA (NI and Agilent) drivers which are compatible with 32/64-bit versions of Windows including XP, Vista, 7 and 8 operating systems. The VISA driver is also compatible with Real-Time Operating Systems such as LabVIEW RT. For other RTOS support contact Pickering.

These drivers may be used with a variety of programming environments and applications including:

- **National Instruments** products (LabVIEW, LabWindows/CVI, Switch Executive, MAX, TestStand, etc.)
- **Microsoft Visual Studio** products (Visual Basic, Visual C+)
- **Agilent** VEE
- **Mathworks** Matlab
- **Geotest** ATE Easy
- **MTQ Testsolutions** Tecap

Drivers for popular Linux distributions are available, other environments are also supported, please contact Pickering with specific enquiries.

Operating/Storage Conditions

Operating Conditions

Operating Temperature:	0°C to +55°C
Humidity:	Up to 90% non-condensing
Altitude:	5000m

Storage and Transport Conditions

Storage Temperature:	-20°C to +75°C
Humidity:	Up to 90% non-condensing
Altitude:	15000m

PXI & CompactPCI Compliance

The module is compliant with the PXI Specification 2.2. Local Bus, Trigger Bus and Star Trigger are not implemented.

Uses 33MHz 32-bit backplane interface.

Safety & CE Compliance

All modules are fully CE compliant and meet applicable EU directives: Low-voltage safety EN61010-1:2001, EMC Immunity EN61000-6-1:2001, Emissions EN55011:1998.

PXI & LXI Chassis Compatibility

Compatible with all chassis conforming to the 3U PXI and 3U cPCI specification. Compatible with Legacy and Hybrid peripheral slots in a 3U PXI Express chassis.

Compatible with Pickering Interfaces LXI Modular Switching chassis. For information on driving your switching solution in an LXI environment refer to the LXI Product Guide.

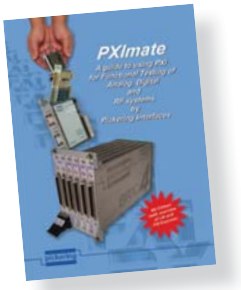
Latest Details

Please refer to our Web Site for Latest Product Details.

www.pickeringtest.com

Please refer to the Pickering Interfaces "**Connection Solutions**" catalog for the full list of connector/cabling options, including drawings, photos and specifications. This is available in either print or as a download. Alternatively our web site has dynamically linked connector/cabling options, including pricing, for all Pickering PXI modules.

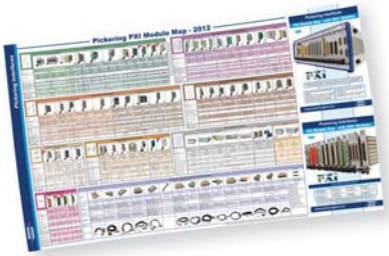
"**The Big PXI Catalog**" gives full details of Pickering's entire range of PXI switch modules, instrument modules and support products.
At over 500 pages, the Big PXI Catalog is available on request or can be downloaded from the Pickering website.



Ever wondered what PXI is all about?

Pickering Interfaces' "**PXImate**" explains the basics of PXI and provides useful data for engineers working on switch based test systems.

The PXImate is available free on request from the Pickering website.



The "**PXI Module Map**" - a simple fold-out selection guide to all Pickering's 600+ PXI Modules.

© Copyright (2013) Pickering Interfaces. All Rights Reserved
Pickering Interfaces maintains a commitment to continuous product development; consequently we reserve the right to vary from the description given in this data sheet.

pickering

pickeringtest.com